From: Owens, Robert
To: Mueller, Brian
Subject: RE: Falcon Refinery RI/FS - Preliminary Arsenic Evaluation
Date: Friday, August 01, 2014 3:10:55 PM

Brian:

I just sent the request to the PRP's lab. I was waiting for my database person to send me the fields that we needed. I'll let you know if we have any trouble getting the data.

Thank you,
Bob Owens
EA Engineering, Science, and Technology, Inc.
Direct: 972-538-2701
Mobile: 972-989-7956

From: Mueller, Brian [mailto:Mueller.Brian@epa.gov]
Sent: Friday, August 01, 2014 2:39 PM
To: Owens, Robert
Cc: McClurg, Rena
Subject: RE: Falcon Refinery RI/FS - Preliminary Arsenic Evaluation

Bob

Great maps! Thank You, tell the map people thank you as well. Are you having success getting the original lab data from the PRP's lab? Have a great weekend

Thanks

Brian W Mueller RPM
EPA R6 Superfund
214 665-7167

From: Owens, Robert [mailto:rowens@eaest.com]
Sent: Friday, August 01, 2014 1:01 PM
To: Mueller, Brian
Subject: Falcon Refinery RI/FS - Preliminary Arsenic Evaluation

Brian:

Attached are three figures that show the arsenic concentrations at the site. They are described further below. We have evaluated the arsenic distribution at the site and are providing our initial observations. These observations may change after we collect additional data during the next round of the evaluation. They are being offered here for discussion purposes.

Arsenic in Soil

- The Arsenic Results in Soil Figure shows all of the sample locations from the site (PRP and EA).

Arsenic was detected in most of the locations since it is a naturally occurring metal. The figure was too cluttered when we attempted to display all of the arsenic results. We have color coded the sample locations based on the level of arsenic detected (not reported, not detected, detected but below background and detected above background concentration). We are showing the data for just those samples where arsenic was detected above background. We are using the preliminary site-specific arsenic concentrations calculated from the background sampling in the area. These values are 3.99 mg/kg for surface soil and 0.99 mg/kg for subsurface soil. Several subsurface samples slightly exceeded the calculated background concentration but only one surface sample (S04-01 at the Barge Dock) exceeded the calculated background concentration. The Texas-specific soil background concentration for arsenic is 5.9 mg/kg. None of the arsenic concentrations at the site exceed that level.

- The sporadic distribution of the low levels of arsenic detected in the soils at the site indicates that arsenic is not a contaminant of potential concern (COPC) from the refinery operations.

Arsenic in Ground Water

- Two Arsenic Results in Ground Water Figures are attached. Both show the arsenic concentrations detected in the ground water samples from the site. The ground water gradient portion of the maps differ. It appears that the surface water in the AOC-3 wetlands is affecting the gradient in that portion of the site. Ground water elevations are approximately one foot higher in the wells located adjacent to these wetlands. One of the attached figures illustrates the impact of the wetlands and the other discounts the impact. The overall ground water flow is the same with both interpretations. Ground water flows from the northeast to the southwest with a gentle slope.

- Since we do not have TDS values, we have used sodium concentrations as an indicator of salinity. The salinity of ground water at the site increases in the areas near the AOC-3 wetlands. This is not unusual in the vicinity of these types of wetlands. Many natural and man induced compounds flow into the wetlands, Since there is not a ready discharge from the wetlands, these compounds tend to concentrate in the wetlands. The sodium levels detected in the surface water of these wetlands ranged from 1,730,000 to 3,490,000 micrograms per liter (ug/l).

- The distribution of arsenic in groundwater increases in the southern portion of the refinery, Based on the review of the historical aerial photographs, the distribution suggests it was influenced within the areas that appear to have been used for agricultural purposes. It may have been further influenced by concentration of runoff from these agricultural areas into the historical tidal marshes. The tidal marshes have been altered and cut off by development in the area, and now are the AOC-3 wetlands.

- The sodium and arsenic results in ground water are provided below. The trend shows that the arsenic concentrations increase as the salinity of the ground water increases. With one exception (MW-15), there is a pattern where once sodium exceeds 229,000 ug/l, the total and dissolved arsenic concentrations are above background (and in most cases, even the MCL).

Please let me know if you have any questions or need anything else.

Thank you,
Bob Owens
EA Engineering, Science, and Technology, Inc.
405 S. Highway 121, Building C, Suite 100
Lewisville, TX 75067

972-315-3922 ext 1210
Direct: 972-538-2701
Mobile: 972-989-7956
Fax: 972-315-5181

Concentrations are micrograms per liter (ug/L)									
Well	Sodium		Arsenic (Total)		Arsenic (Dissolved)		Screening Value	Criteria	Background
MW-01	23,700	J	4		3.6				
MW-02	20,600	J	3.6		3.2				
MW-03	28,800	J	8.1		7.6				
MW-03 Dup	29,700	J	7.8		7.3				
MW-04	49,100	J	1.5		1.4				
MW-05	62,100	J	10.2		8.6				
MW-06	70,200	J	5.4		5.3				
MW-07	68,100		8.6		8.3				13.75 (Total)
MW-08	251,000		3.7	J+	3.9		10	MCL	14.89 (Dissolved)
MW-09	229,000		6.7		6				
MW-10 Dup	2,910,000		26.1	J+	35				
MW-10	3,080,000	J	25.9		29.1	J+			
MW-11	2,310,000		54.2		51.4				
MW-12	21,800,000		200	U	200	U			
MW-13	4,390,000		25	U	25	U			
MW-15	267,000	J	22.6		21.8				
MW-16	10,300,000	J	50	U	55.5	J+			
MW-17	1,290,000	J	60.4		60.8				